Listing of Claims

1. (currently amended) A method of fabricating an optical fiber laser, the method comprising:

exposing an optical fiber to a transverse writing light beam to form a DFB grating structure in a section of the optical fiber, the writing light beam being polarized in a direction not parallel to the axis of the section of the optical fiber so that the induced grating structure has a different grating strength for two orthogonal polarization modes of the optical fiber; and

moving at least one of the optical fiber and the writing light beam between each exposure;

wherein the grating structure has a discrete phase shift which is substantially identical for the two orthogonal polarization modes and the grating structure is formed without ~~tuning of the discrete phase shift~~ introducing a phase shift by post processing of the grating structure.

2. (previously presented) A method according to claim 1, in which the writing light beam is polarized in a direction substantially perpendicular to the axis of the section of the optical fiber.

3. (previously presented) A method according to claim 1, in which the writing light beam is an ultraviolet beam.

4. (previously presented) A method according to claim 3, in which the ultraviolet beam has a wavelength of about 244 nanometers.

5. (previously presented) A method according to claim 1, in which the optical fiber section is doped with at least one amplifying dopant.

6. (previously presented) A method according to claim 5, in which the optical fiber section is doped with at least one rare earth element.

7. (previously presented) A method according to claim 6, in which the optical fiber section is doped with erbium and ytterbium.

8. (previously presented) A method according to claim 1, wherein the optical fiber laser is stressed to provide substantially single polarization operation.

9. (previously presented) A method according to claim 1, wherein the optical fiber laser is stressed to provide dual polarization operation.

10. (previously presented) A method according to claim 1, wherein the grating structure is written as a Moire phase shifted structure to provide lasing operation at two wavelengths having one polarization.

11. (previously presented) A method according to claim 1, wherein the grating structure is written as first and second overlaying DFB grating structures to provide lasing operation at two wavelengths having one polarization.

12-26. (cancelled)

27. (currently amended) A method of fabricating an optical fiber laser, the method consisting of the step of exposing an optical fiber to a transverse writing light beam to form a grating structure in a section of the optical fiber, the writing light beam being polarized in a direction not parallel to the axis of the section of the optical fiber so that the induced grating structure has a different grating strength for two orthogonal polarization modes of the optical fiber, the grating structure having a discrete phase shift which is substantially identical for the two orthogonal polarization modes and the grating structure is formed without introducing a phase shift by post processing of the grating structure.

28. (previously presented) A method according to claim 27, in which the writing light beam is polarized in a direction substantially perpendicular to the axis of the section of the optical fiber.

29. (previously presented) A method according to claim 27, in which the writing light beam is an ultraviolet beam.

30. (previously presented) A method according to claim 29, in which the ultraviolet beam has a wavelength of about 244 nanometers.

31. (previously presented) A method according to claim 27, in which the optical fiber section is doped with at least one amplifying dopant.

32. (previously presented) A method according to claim 31, in which the optical fiber section is doped with at least one rare earth element.

33. (previously presented) A method according to claim 32, in which the optical fiber section is doped with erbium and ytterbium.

34. (previously presented) A method according to claim 27, wherein the optical fiber laser is stressed to provide substantially single polarization operation.

35. (previously presented) A method according to claim 27, wherein the optical fiber laser is stressed to provide dual polarization operation.

36. (previously presented) A method according to claim 27, wherein the grating structure is written as a Moire phase shifted structure to provide lasing operation at two wavelengths having one polarization.

37. (previously presented) A method according to claim 27, wherein the grating structure is written as first and second overlaying DFB grating structures to provide lasing operation at two wavelengths having one polarization.

38. (previously presented) A method according to claim 1, wherein the movement is carried out such that at least a majority of grating lines from the grating

structure are generated by exposure to different respective regions of the writing light beam.

39. (previously presented) A method according to claim 27, wherein the grating structure is a DFB grating structure.

40. (previously presented) A method according to claim 27, wherein the grating structure is formed without tuning of the discrete phase shift.